

Is It Important to Increase Physical Activity Among University Students During the Second-Wave COVID-19 Pandemic in Asian Countries? A Cross-Sectional Study of the Knowledge, Attitudes, and Practices in Asian Countries

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Background: Difficulties in exercising have occurred for the entire world's population during this COVID-19 pandemic, especially in the second wave at the end of 2021. Most worrying is the lack of physical activity in young adults, as lack of exercise will increase the risk of noncommunicable diseases in the future. The youth such as university student can be agents of change, to increase physical activity, from sedentary to sport life. This study aimed to determine the relationship between knowledge, attitudes, and actions of university students and the correlation between the related variables.

Methods: This study is a cross-sectional observational study involving 458 Asian university students based on Asian and African nationalities. This research was conducted from December 2021 to January 2022, during the second wave of the COVID-19 pandemic in Asia. The variables studied were the knowledge, attitudes, and actions of university students with regard to sports, and the statistical test used was the Chi-squared test.

Results: The results showed that the research subjects were mainly from Indonesia and India (95.8%), there were more women than men (69.9% vs 30.1%), the most common age range was 18–20 years (61.4%), and 45.4% had a normal body mass index. In total, 48.3% had high knowledge, 93.4% had a positive attitude, and 34.7% had good practice. There was a significant relationship between knowledge and attitude ($p=0.002$) but not with action.

Conclusion: This study found that good knowledge was associated with a good attitude, but due to the COVID-19 pandemic with activity restrictions on university students, there was no relationship with action.

Keywords: athlete, exercise, physical activity, understand, youth

Introduction

During the COVID-19 pandemic, there have been increases and decreases in cases in several countries; people's knowledge–attitude–actions influenced this dynamic change and the spread of infection^{1–4} Other factors were the success of vaccination programs, implementation of strict health protocols, mutation of the coronavirus, and increased immunity either through the process of forming natural immunity or through the vaccination process.^{5–7}



During the pandemic, there was an increase at the end of 2021, perhaps due to the habit of gathering during the year-end long holiday.^{8–10} The emergence of the Delta variant in July 2021 and the increasingly active vaccination process caused the rise and fall of COVID-19 cases throughout the year.^{10–12} At the end of the year, there was also a wider spread of cases due to the operation of workplaces and working together in closed spaces.¹³ This second wave led to the enactment of lockdowns and restrictions on activities in several countries, including Indonesia and India.

Restrictions on activities during the COVID-19 pandemic have reduced physical activity in all over the world.^{4,14,15} Many sports locations are closed, and the physical activities available are walking and sitting.^{4,15–17} Previous research in many countries such as Italy, United States of America, and Saudi Arabia have stated that staying at home causes low physical activity and laziness to become more common, especially among students.^{15,18,19} Sports activities are increasing but not as physical activity; sports are developing in the form of e-sports.¹⁹

Research during the COVID-19 pandemic provides information about the reduced physical activity in children and adults.^{4,18–20} The results also show the importance of supporting physical activity for children outside, especially in schools, sports venues, and public sports places used by the surrounding community.⁴ This requires an understanding of students' knowledge, attitudes, and actions.

Exercise is important during this COVID-19 pandemic.^{21,22} The results of previous studies have shown that lockdowns and quarantines due to the COVID-19 pandemic led to a lack of physical activity and a consequent decline in mental health.⁴ Lack of knowledge, high negative attitudes, and lack of action in increasing physical activity cause the risk of noncommunicable diseases in the future to increase, such as obesity, hypertension, and coronary heart disease.⁴ These diseases must be avoided.

Based on previous research and students' views, this study was conducted with the aim to understand the knowledge, attitudes, and actions of students in various countries, especially in Asian and African countries, regarding physical activity during the COVID-19 pandemic. This research is expected to provide in-depth information about how to increase physical activity in students in various countries.

Methods

Study Design

This study was an observational study with a cross-sectional design that collected general data from students, including national origin, age, sex, weight, and height. Furthermore, the data collected included exercise habits, knowledge, attitudes, and actions.

This data collection was conducted through the distribution of Google forms through several social media applications such as WhatsApp (WA) and email. The research subjects read the research subject explanation sheet at the beginning of the data form, and if they agreed, they filled out all the questions in the Google form. Filling in online was done voluntarily and without any coercion; if the research subject did not agree, they did not fill out the Google form completely, and the data were not recorded.

The research subjects came from several countries and were randomly distributed over a period of one month, December 2021 to January 2022, with the link: https://bit.ly/QUESTIONNAIRES_JR. The distribution of the Google form was carried out by involving countries involved in the Erasmus Plus funding project, namely the SPIRIT project, namely "Sport and Physical Education as a Vehicle for Inclusion and Recognition in India, Indonesia, and Sri Lanka." Data dissemination was carried out after obtaining permission for ethical review from the Ethics Committee of the Universitas Sumatera Utara.

Participants

The inclusion criteria were student or athlete, man or woman, aged 18–26 years old, healthy, and capable of filling out the Google form. Exclusion criteria were students with incomplete personal data and students who did not complete the answer choices on the questionnaire. In total, 458 research subjects filled out the Google form; most of them were from Indonesia and India universities, including Indonesia, India, Malaysia, Nepal, and Somalia nationality.

The Google form consisted of four parts; the first part was a questionnaire containing five questions for initial information, ten questions for knowledge, ten questions for attitude, and ten questions for exercise habits. The validity and reliability test of the questionnaire was carried out. The validity test is a method to show that the measuring instrument really measures what it aims to measure. The correlation between the scores of each item and the total score of the questionnaire was tested for validity. If all questions had a significant correlation, then, the correlation values for each question were considered significant. A total of ten respondents were tested for questionnaire validation, and the required significance level was 0.632. A questionnaire is declared significant if the value of each item exceeds the significance level in each question item. All questions that exceeded the specified value were included in the research questionnaire.

A reliability test is an index that shows a measuring instrument can be trusted and relied on. High reliability indicates that the questionnaire can be used as a data collection instrument. The Cronbach's Alpha coefficient (C) is the statistic most often used to test the reliability of research measuring instruments. A research measuring instrument has adequate reliability if the Cronbach's Alpha Coefficient (C) is greater than or equal to 0.60.

Statistical Analysis

Data analysis in this study used the statistical program IBM SPSS version 11.5 (IBM Corp., Chicago, IL). Categorical variables were presented in the form of percentages to analyze the relationship of each categorical parameter. Meanwhile, continuous data were analyzed first for distribution using the Kolmogorov-Smirnov test; if the data were normally distributed, they were presented in the form of mean \pm SD; whereas, if they were not normal, then, they were presented in the form of medians (minimum-maximum). The Chi-squared test was used, but if the data did not meet the requirements, Fisher's test was used. The limit of significance used in this study was 5%, with the provision that it was not significant if $p > 0.05$.

Sample Size

For the sample size calculation, we used the Slovin formula, which calculates the minimum number of samples in a limited population survey that aims to estimate the proportion of the population. The value of the margin of error set by the researcher was 3% with a population size of 753 people, and the obtained sample size was 448 or a minimum of 450 research samples.

Questionnaires

Data were collected from a questionnaire consisting of four parts, with the first part containing general data, the second part being a knowledge questionnaire, the third part being an attitude questionnaire, and the fourth part being an action questionnaire. The first part contained general data about the characteristics of the research subjects, including age, sex, country of origin, weight, height, where to get information about exercise and proper nutrition, places to exercise, and matters related to the desire to exercise.

The second part was a knowledge questionnaire containing ten questions about the knowledge of research subjects about exercise, including whether the research subjects knew about the importance of exercising, the duration of exercise with low, medium, and high intensity, assessment of exercise adequacy, the main source of energy when exercising, types of aerobic and anaerobic exercise, and when exercise is effective.

The third part contained an attitude questionnaire, with statements agreeing or disagreeing about sports-related matters such as whether the subject agreed or not to fill spare time with exercise, increasing exercise activities to avoid disease, arranging a special schedule for exercise, that exercise can be done anywhere, the need for assistance in exercising, and some attitudes related to the decision to exercise.

The fourth part contained an action questionnaire, determining the frequency of the research subjects in playing sports. This included data on how often they exercised, how long they exercised in a day, how long they warmed up, how long they rested, and what they ate during exercise.

Knowledge measurement asked the subject to give one correct answer choice. If the answer was correct, it obtained a value of 1, and if the answer was wrong, it was given a value of zero. Based on the assessment, knowledge was

categorized as “high” if the correct values were between 7 and 10, “medium”, if the correct values were between 4 and 6, and “low”, if the correct values were between 0 and 3.

To measure attitudes, the questions asked had the choices of agree and disagree. An agreement obtained a value of 1, and a disagreement obtained a value of 0. Based on the assessment, the attitude was categorized as “positive” if the agree values were between 6 and 10, and negative if the agree values were between 0 and 5.

To measure practice, the answers were always, rarely, and never. If the answer was always for frequency, it obtained a score of 2, if the answer was rarely for frequency, it obtained a value of 1, and if the answer was never for frequency, it obtained a value of 0. Based on the assessment, frequency was categorized as “good” if the always values were between 7 and 10, “fair”, if the always values were between 4 and 6, and “poor”, if the always values were between 0 and 3. Before this questionnaire was used in research, a trial of the instrument was conducted to assess content validity, namely by obtaining validity from physician, nutritionist, and sports doctor.

Anthropometric Data

Anthropometric data included height (TB) and weight (BB) based on information from the study subjects. The results of these measurements were used to determine body mass index (BMI). Body mass index is calculated by dividing body weight (BB) in kilograms by height (TB) squared in meters (kg/m^2). The BMI classification is as follows: underweight, which is less than $18.5 \text{ kg}/\text{m}^2$; normal, which is in the range of $18.5\text{--}22.9 \text{ kg}/\text{m}^2$; overweight, which is in the range of $23\text{--}24.9 \text{ kg}/\text{m}^2$; and obese, which is greater than or equal to $25 \text{ kg}/\text{m}^2$.^{23,24}

Ethics Approval and Consent to Participate

This research received ethical approval, based on the guidelines of the Declaration of Helsinki; all research subjects involved read about the purpose of this research. All research subjects consciously agreed to fill out the Google form after the written explanation of the research and research subjects were also given the freedom to not participate in the study if they did not agree with the procedures described. The consent obtained was written and approved via Institutional Review Board (IRB) and research procedures were tested and approved ethically by the Universitas Sumatera Utara (USU) Ethical Committee, No. 1082/KEP/USU/2021.

Results

Study Population

The results of this study included responses from 458 research subjects who filled out the complete questionnaire. Data were collected by downloading a Google sheet that was filled in between December 16th, 2021 and January, 21st, 2022. All data were collected and analyzed. The average age of the participants was 19.46 ± 1.61 years (mean \pm standard deviation/SD) with various Asian and African nationalities.

Table 1 shows the characteristic data of the research subjects; weight and height data were obtained from the research subjects. Based on the information provided, the average body weight of the research subjects was $61.52 \pm 16.34 \text{ kg}$, with the minimum–median–maximum weight being 38, 58, and 185 kg, respectively. The average height of the research subjects was $162.79 \pm 7.96 \text{ cm}$, with the minimum–median–maximum heights being 130, 162, and 192 cm, respectively. Meanwhile, the mean BMI was $23.1 \pm 5.39 \text{ kg}/\text{m}^2$, with the minimum–median–maximum BMI values being 15.61, 22.27, and $65.55 \text{ kg}/\text{m}^2$, respectively.

Table 2 contains frequency distribution of exercise habit, how do research subjects understand about exercise habits. Most of the research subjects did exercise regularly (61.1%), aiming to achieve health (56.8%), with the most frequent exercise being aerobic (61.4%); during this second wave, exercise activities were carried out at home. (77.3%). Sports activities were carried out alone (73.8%); the difficulty in playing sports apart from the limitations due to the COVID-19 pandemic was the high class schedule (51.5%), and most research subjects obtained information about exercise from the internet/social media (92.1%).

Table 1 Characteristic Data of the Research Subjects

Variable	n=458	%
Country		
– Indonesia	383	83.6
– India	56	12.2
– Malaysia	15	3.2
– Nepal	3	0.7
– Somalia	1	0.2
Gender		
– Male	138	30.1
– Female	320	69.9
Age (years old)		
– 18–20	281	61.4
– 21–23	164	35.8
– 24–26	13	2.8
Body Mass Index (kg/m ²)		
– Less than 18.5	58	12.7
– 18.5–22.9	208	45.4
– 23–24.9	80	17.5
– 25–30	80	17.6
– More than 30	32	7
Height (cm)		
Male		
– Less than 160	7	5.1
– 160–170	73	52.9
– More than 170	58	42
Female		
– Less than 155	52	16.3
– 155–160	150	46.9
– More than 160	118	36.9

Note: Categorical data were presented on several subjects and percentages.

Knowledge, Attitude, and Action

The knowledge questionnaire (Table 3) provided answers to knowledge questions based on exercise and nutrition reference books. There were ten questions per section, but five questions were displayed at a time. Most of the questions were answered correctly by the research subjects, as well as attitudes (Table 4) and actions (Table 5).

In terms of the attitude questionnaire (Table 4), there were answers that indicated disagreement with several attitudes, including research subjects who did not agree with the statement: “will fill their spare time with activities other than exercise”, in addition to “exercise can make the body healthy” or “avoid disease”. The action questionnaire (Table 5) showed the lack of sports activities carried out; this was indicated by the length of exercise time and a short warm-up period.

Low knowledge was found in 3.7% of the total research subjects, while the medium and high knowledge categories almost had the same percentages (48% and 48.3%, respectively). Meanwhile, the attitude category had higher positive attitudes than negative attitudes (93.4% vs 6.6%). For the action category, 34.7% were ranked good, 59% were fair, and 6.3% were poor.

Table 2 Frequency Distribution of Exercise Habit

Variable	n=458	%
Do you do your exercise routinely?		
– Sometimes	280	61.1
– Yes	106	23.1
– No	72	15.7
What is the goal of exercising		
– Health performance	260	56.8
– Maintain endurance	120	26.2
– Train muscle mass	78	17
What kind of sports do you often do		
– Aerobics	281	61.4
– Aerobics and anaerobic	164	35.8
– Anaerobic	13	2.8
Where do you usually exercise		
– House	354	77.3
– Public facilities	84	18.3
– Fitness center	20	4.4
Who do you usually exercise with		
– Alone	338	73.8
– Friends	93	20.3
– Personal trainer	15	3.3
– Family	12	2.6
What things keep you away from exercise		
– Busy class schedule	236	51.5
– Do not have free time	165	36.0
– No friends to exercise with	36	7.9
– When the weather is not good	21	4.6
Where did you get your knowledge about sports		
– Internet/social media	422	92.1
– Book	31	6.8
– Newspaper	5	1.1

Note: Categorical data were presented on several subjects and percentages.

Table 6 shows that there was a relationship between the knowledge and attitudes of research subjects ($p=0.003$), but there was no relationship between attitudes and actions or knowledge and actions (Tables 7 and 8).

Discussion

The COVID-19 pandemic is still ongoing in all parts of the world, and a number of countries are still trying to overcome this pandemic.^{10,25} At the beginning of 2021, there was a decrease in cases, but in the middle of the year, June 2021, there was a second wave.^{8,11} The number of positive cases of COVID-19 increased and decreased, so they were grouped into one wave.⁸ The occurrence of the second wave that was felt until the end of the year was caused by the opening of flights with looser quarantine regulations due to various considerations, especially economic, the holiday period, which had just ended, and the relaxation of health protocols due to cases that had been tending to decline.^{8,9} At the end of 2021, the number of cases decreased again; however, there is the possibility of a third wave with the discovery of the Omicron variant.²⁶ The government re-implemented health protocols, reduced activities outside the home, closed health and fitness centers, increased vaccination rates, and used personal protective equipment after a decline.¹³

Table 3 Frequency Distribution of Exercise Knowledge

Variable	n=458	%
What is the meaning of exercise? – Planned, structured, and repetitive physical activity – Planned, dependent, and repetitive physical activity – Unplanned, structured, and repetitive physical activity	406 36 16	88.6 7.9 3.5
From where do you judge that the exercise you do is enough? – Pulse per minutes – Much sweat – Heavy breathing	203 135 120	44.3 29.5 26.2
What is the main source of energy for exercise? – Carbohydrate – Protein – Mineral	312 116 30	68.1 25.3 6.6
What are the types of aerobic exercise – Swimming – Football – Basketball	381 50 27	83.2 10.9 5.9
What are the types of anaerobic exercise – Basketball – Jogging – Running	204 130 124	44.5 28.4 27.1
Where did you get your knowledge about sports? – Internet or social media – Book – Newspaper	420 32 6	91.7 7.0 1.3
What is the average duration of high– intensity exercise per week? – 150 minutes per week – 300 minutes per week – 450 minutes per week	90 176 192	19.7 38.4 41.9
What is the average duration of low– intensity exercise in a week? – 75 minutes per week – 150 minutes per week – 300 minutes per week	355 93 10	77.5 20.3 2.2
In addition to maintaining endurance, the benefits of exercising can be used as? – Recreation – Fill the free time – All answers are wrong	103 220 135	22.5 48 29.5
In your opinion, when is the most effective time to exercise – Morning – Midday – Evening	334 26 98	72.9 5.7 21.4

Note: Categorical data were presented in several subjects and percentages.

The results of this study indicate that during the second wave, teaching and learning activities were more focused on online learning. For students, the conditions of studying at home created limitations in playing sports, and teaching and learning activities using computers or gadgets encouraged students to focus with minimal movement.^{4,14,27–30} The

Table 4 Frequency Distribution of Exercise Attitudes

Variable	n=458	%
I prefer to fill my free time with other things than exercise		
– Agree	277	60.5
– Disagree	181	39.5
I exercise to keep my body fit and to avoid diseases		
– Agree	444	96.9
– Disagree	14	3.1
I feel my body is fit if I do exercise regularly		
– Agree	439	95.9
– Disagree	19	4.1
I set a particular schedule to be able to exercise		
– Agree	311	67.9
– Disagree	147	32.1
My goal is to exercise to achieve an achievement		
– Agree	289	63.1
– Disagree	169	36.9
I think that exercising is an activity that must be done regularly		
– Agree	440	96.1
– Disagree	18	3.9
I think exercise can have a positive impact on us		
– Agree	456	99.6
– Disagree	2	0.4
I think exercise can be done anywhere and anytime		
– Agree	345	75.3
– Disagree	113	24.7
I need a friend or companion when I exercise so I do not feel bored		
– Agree	236	51.5
– Disagree	222	48.5
I think about 150 minutes of exercise per week is enough		
– Agree	398	86.9
– Disagree	60	13.1

Note: Categorical data were presented in several subjects and percentages.

activity of walking, sitting, and centered movement of the hands increased, and a sedentary lifestyle was more common among students.^{29,30} However, most of the knowledge about sports was classified as good and had a significant relationship with attitude, which means that if there were no relationship between knowledge and attitude, the probability factor alone explained 0.3% of the results obtained.

Previous research also reported that the virtual learning model changed daily activities with varied sports education.^{4,19} Sports education is hampered by an inappropriate understanding of physical activity.^{20,31} Counseling on the importance of exercise should be modified in accordance with the conditions of the COVID-19 pandemic. By collecting various research results on sports education, it is advisable to provide a new guide to understanding sport from a different perspective by looking at these various types of limitations.^{32,33}

The results of this study indicate that good education is only related to attitudes but not to actions. All behaviors that include knowledge, attitudes, and actions are interconnected, especially in the final result, namely a change in action.

Table 5 Frequency Distribution of Exercise Action

Variable	n=458	%
How much time do you spend exercising in a day		
– Less than 15 minutes	216	47.2
– Less than 30 minutes	179	39.1
– Less than 60 minutes	63	13.8
How long do you need to warm up before exercising		
– Less than 5 minutes	349	76.2
– Less than 10 minutes	103	22.5
– Less than 30 minutes	6	1.3
At what time do you often exercise		
– Morning	202	44.1
– Afternoon	175	38.2
– Evening	81	17.7
What actions do you take before exercising		
– Warm– up	413	90.2
– Drink water	28	6.1
– Eat	17	3.7
What do you take after exercising		
– Mineral water	411	89.7
– Energy drink	38	8.3
– Food	9	2.0
How many times did you exercise in the last seven days?		
– 1–4 times	280	61.1
– 5–7 times	44	9.6
– There is no time	134	29.3
How much time do you need to rest after you finish exercising		
– Less than 15 minutes	257	56.1
– Less than 30 minutes	158	34.5
– Less than 60 minutes	43	9.4
What actions do you take to avoid injury while exercising?		
– Warm– up before exercise	118	25.8
– Cool down after exercise	28	6.1
– Do both	312	68.1
What actions do you take to support your sports performance?		
– Scheduling exercises in a structured way	160	34.9
– Taking vitamins and supplements	50	10.9
– All the answers are correct	248	54.1
What sports do you usually do to keep your body fit		
– Aerobics	407	88.9
– Anaerobic	51	11.1
– Aerobics and anaerobic	0	0

Note: Categorical data were presented in several subjects and percentages.

Table 6 Association Between Knowledge and Attitudes

Levels of Variables		Attitudes n(%)		p
		Negative	Positive	
Knowledge n(%)	Low	3 (17.6)	14 (82.4)	0.003
	Medium	21 (9.5)	199 (90.5)	
	High	6 (2.7)	215 (97.3)	
Total		30 (6.6)	428 (93.4)	

Note: Categorical data are presented as the number of the subject and percentage. Associations between each variable were found using the Chi-square test.

Table 7 Associations Between Knowledge and Practices

Levels of Variables		Practice n(%)			p
		Poor	Fair	Good	
Knowledge n(%)	Low	2 (11.8)	10 (58.8)	5 (29.4)	0.227
	Medium	19 (8.6)	126 (57.3)	75 (34.1)	
	High	8 (3.6)	134 (60.6)	79 (35.7)	
Total		29 (6.3)	270 (59)	159 (34.7)	

Notes: Categorical data are presented as the number of the subject and percentage. Associations between each variable were found using the Chi-square test.

Table 8 Associations Between Attitudes and Practice

Levels of Variables		Practice n(%)			p
		Poor	Fair	Good	
Attitudes n(%)	Negative	2 (6.7)	23 (76.7)	5 (16.7)	0.094
	Positive	27 (6.3)	247 (57.7)	154 (36)	
Total		29 (6.3)	270 (59)	159 (34.7)	

Notes: Categorical data are presented as the number of the subject and percentage. Associations between each variable were found using the Chi-square test.

Although several previous studies have shown clear changes and analyses, this study clearly shows that limitations mean all research subjects need to take appropriate actions to increase physical activity.

The high body mass index in this study shows that obesity cases were found in a high percentage in this young age group. For two years, physical and social restrictions have been imposed; hence, low physical activity conditions make the prevalence of obesity high. This has also been found in other studies; so, it is necessary to think about the right form of exercise to increase the interest of young people in physical activity.

There was also a higher percentage of low height in the group of men and women, and the women had a higher percentage of lower than normal height than men. Height is not a short-term process, and it depends on the conditions during a person's growth period. The intake of calcium and vitamin D are key to supporting a person's height. Likewise, nutritional conditions during a child's first 1000 days of life are key to a person's height in adulthood.³⁴⁻³⁶

The right exercise, namely bodyweight exercise, is an option for calcium accumulation in addition to sun exposure.^{37,38} The choice of basketball and jumping maximizes calcium compression.^{39,40} The results of previous studies

indicate that increasing physical activity can also improve immunity; hence, young adults should be given an appropriate understanding of the target.

This study analyzed various causes that can form the basis of strategies for increasing physical activity, especially in young adults. Extension techniques and socialization of increasing physical activity must also consider the needs and interests of the target group. Things that can be reviewed are the locations for sports, free time to exercise, and the right type of exercise adapted to the conditions of the COVID-19 pandemic.

The drawback of this study is that data on anthropometric parameters such as height and weight were obtained from information on research subjects. This could be classified as interview bias, but the researchers provided an explanation of the importance of this research; so, it is hoped that the research subjects provided truthful answers. In addition, the research subjects filled out the Google form directly, so that the possibility of inaccurate data could be minimized. There limitation of this research was also recall bias, relates to the fact that all responses are subjective and all subjects completed the survey at one timepoint, this could be the weakness of this study.

Conclusions

This study found that there was a relationships between the knowledge and attitude, but due to the COVID-19 pandemic with activity restrictions on the university student, there was no relationship with action. All behaviors that include knowledge, attitudes, and actions are interconnected, especially in the end result, namely changes in actions. Lack of physical activity based on the knowledge and action provides a basis for changing exercise habits, including sports areas, free time for exercise, and the right type of exercise.

Data Sharing Statement

The Excel data used to support the findings of this study have been deposited in the SPIRIT RAW DATA repository DOI: <https://doi.org/10.6084/m9.figshare.19448723>.

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Author Contributions

All authors made a significant contribution to this study, whether in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; the drafting, revising, or critically reviewing of the article; giving final approval of the version to be published; agreeing on the journal to which the article has been submitted; and agreeing to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest or financial interest in this work.

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